

ABSTRACT OF THE DISCLOSURE

The invention relates to a photo mask blank, a photo mask, a method and an apparatus for manufacturing a photo mask blank in general, and for manufacturing a photo mask blank by particle beam sputtering in particular. It is an object of the invention to provide a method of manufacturing a photo mask blank of high quality and high stability that is suitable for the production of a photo mask having small structures. The invention proposes a method for manufacturing a photo mask blank, wherein a substrate and a target are provided in a vacuum chamber. The target is sputtered by irradiating with a first particle or ion beam and at least a first layer of a first material is deposited on the substrate by the sputtering of said target.